

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P910302

Luminaire Tested: DFN2DIP-TR4F0-120D080US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910302  
REPORT IS A COMBINATION OF REPORTS P900457 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D080US840-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

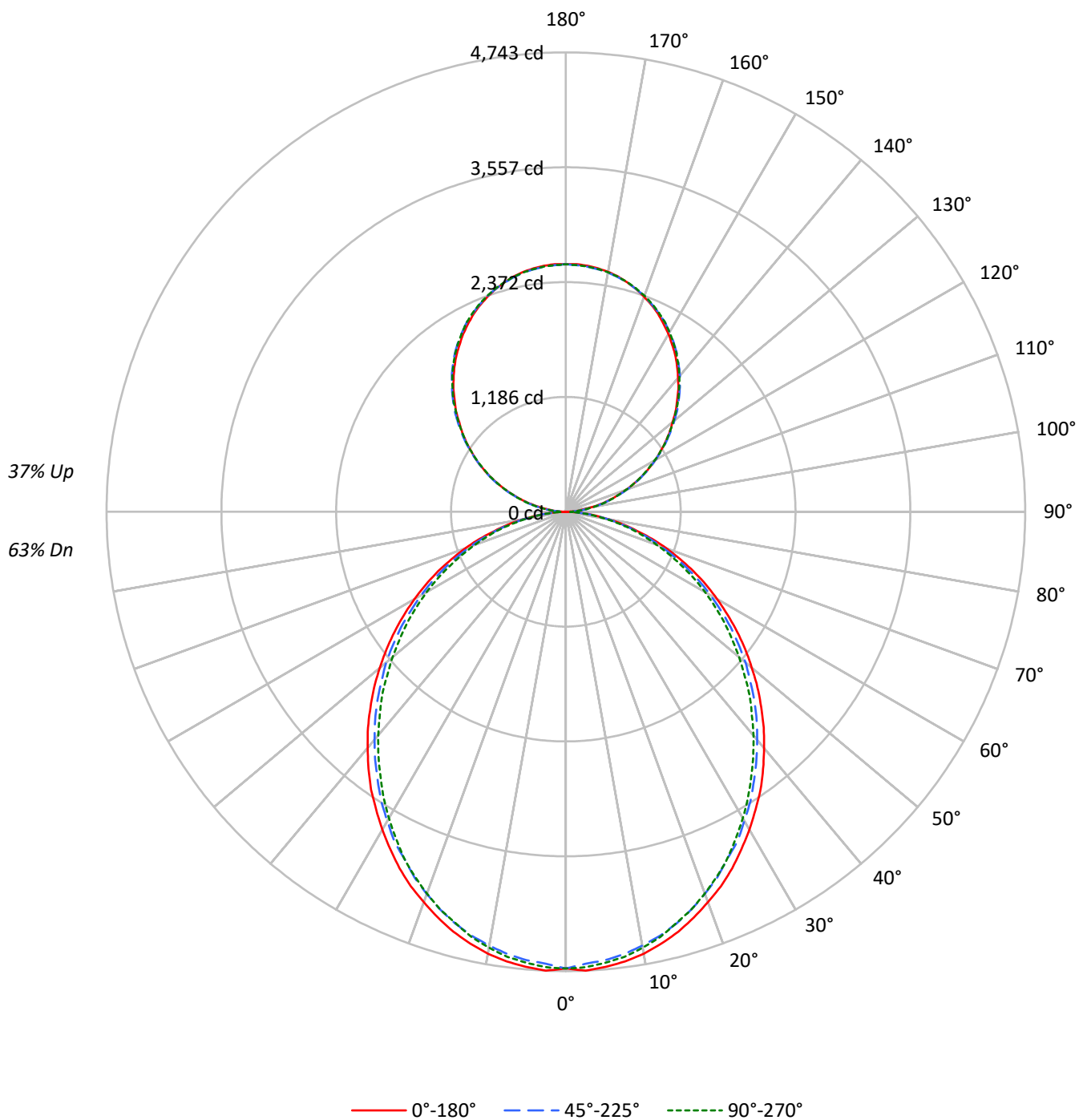
Lumens per Lamp: N/A  
Luminaire Lumens: 19147.0 lumens  
Efficiency: N/A  
Efficacy: 103.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 184.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



TEST NUMBER: P910302

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 79 | 77 | 74 | 69 | 67 | 66 | 60 | 59 | 57 |
| 2   | 92  | 84  | 78  | 72  | 86  | 79  | 73  | 69  | 70 | 65 | 62 | 61 | 58 | 55 | 53 | 50 | 48 |
| 3   | 84  | 74  | 66  | 60  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 54 | 50 | 46 | 47 | 44 | 41 |
| 4   | 77  | 66  | 57  | 51  | 71  | 62  | 54  | 49  | 55 | 49 | 44 | 48 | 43 | 40 | 42 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 38 | 35 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 30  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3746 | 3746 | 3746 |
| 5°  | 3752 | 3694 | 3719 |
| 10° | 3722 | 3644 | 3668 |
| 15° | 3667 | 3584 | 3589 |
| 20° | 3593 | 3501 | 3509 |
| 25° | 3520 | 3401 | 3415 |
| 30° | 3427 | 3308 | 3297 |
| 35° | 3340 | 3199 | 3172 |
| 40° | 3233 | 3088 | 3052 |
| 45° | 3125 | 2977 | 2930 |
| 50° | 3008 | 2861 | 2789 |
| 55° | 2885 | 2726 | 2659 |
| 60° | 2747 | 2567 | 2510 |
| 65° | 2596 | 2401 | 2334 |
| 70° | 2403 | 2200 | 2145 |
| 75° | 2136 | 1958 | 1971 |
| 80° | 1815 | 1651 | 1637 |
| 85° | 1313 | 1120 | 1085 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3125 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 443.8   | 2.3       |
| 10°-20°   | 1248.7  | 6.5       |
| 20°-30°   | 1835.1  | 9.6       |
| 30°-40°   | 2131.4  | 11.1      |
| 40°-50°   | 2128.7  | 11.1      |
| 50°-60°   | 1856.2  | 9.7       |
| 60°-70°   | 1372.1  | 7.2       |
| 70°-80°   | 776.3   | 4.1       |
| 80°-90°   | 212.2   | 1.1       |
| 90°-100°  | 158.1   | 0.8       |
| 100°-110° | 502.4   | 2.6       |
| 110°-120° | 859.7   | 4.5       |
| 120°-130° | 1130.6  | 5.9       |
| 130°-140° | 1269.1  | 6.6       |
| 140°-150° | 1244.5  | 6.5       |
| 150°-160° | 1043.9  | 5.5       |
| 160°-170° | 692.3   | 3.6       |
| 170°-180° | 242.0   | 1.3       |
| 0°-30°    | 3527.6  | 18.4      |
| 0°-40°    | 5659.0  | 29.6      |
| 0°-60°    | 9643.8  | 50.4      |
| 0°-90°    | 12004.4 | 62.7      |
| 90°-120°  | 1520.1  | 7.9       |
| 90°-150°  | 5164.3  | 27.0      |
| 90°-180°  | 7143.0  | 37.3      |
| 0°-180°   | 19147.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4715 | 4715  | 4715 | 4715  | 4715 |      |
| 5°   | 4715 | 4698  | 4648 | 4684  | 4675 | 448  |
| 15°  | 4489 | 4462  | 4403 | 4421  | 4398 | 1264 |
| 25°  | 4062 | 4026  | 3950 | 3958  | 3950 | 1869 |
| 35°  | 3505 | 3460  | 3387 | 3360  | 3337 | 2189 |
| 45°  | 2852 | 2820  | 2752 | 2703  | 2684 | 2201 |
| 55°  | 2158 | 2131  | 2077 | 2022  | 2000 | 1930 |
| 65°  | 1456 | 1428  | 1383 | 1342  | 1320 | 1439 |
| 75°  | 762  | 753   | 730  | 703   | 712  | 813  |
| 85°  | 186  | 181   | 177  | 163   | 159  | 207  |
| 90°  | 2    | 28    | 76   | 71    | 73   | 18   |
| 95°  | 112  | 134   | 138  | 138   | 134  | 125  |
| 105° | 464  | 470   | 474  | 478   | 478  | 489  |
| 115° | 863  | 875   | 871  | 869   | 863  | 853  |
| 125° | 1255 | 1274  | 1268 | 1261  | 1259 | 1121 |
| 135° | 1623 | 1647  | 1652 | 1649  | 1643 | 1254 |
| 145° | 1970 | 1986  | 1998 | 2000  | 1992 | 1231 |
| 155° | 2253 | 2259  | 2266 | 2277  | 2270 | 1037 |
| 165° | 2451 | 2449  | 2449 | 2464  | 2453 | 691  |
| 175° | 2550 | 2544  | 2540 | 2555  | 2542 | 242  |
| 180° | 2555 | 2555  | 2555 | 2555  | 2555 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4715.4 | 4715.4 | 4715.4 | 4715.4 | 4715.4 |
| 2.5°   | 4742.7 | 4720.1 | 4670.1 | 4715.4 | 4706.7 |
| 5°     | 4715.4 | 4697.5 | 4647.5 | 4683.6 | 4674.9 |
| 7.5°   | 4683.6 | 4656.6 | 4606.6 | 4643.2 | 4634.1 |
| 10°    | 4634.1 | 4602.3 | 4547.9 | 4584.0 | 4570.6 |
| 12.5°  | 4565.7 | 4538.7 | 4484.4 | 4507.0 | 4497.8 |
| 15°    | 4488.8 | 4461.8 | 4402.6 | 4420.9 | 4398.3 |
| 17.5°  | 4393.5 | 4366.6 | 4307.4 | 4330.0 | 4307.4 |
| 20°    | 4289.1 | 4262.1 | 4198.7 | 4212.1 | 4194.4 |
| 22.5°  | 4185.2 | 4144.3 | 4085.1 | 4085.1 | 4076.0 |
| 25°    | 4062.5 | 4026.4 | 3949.5 | 3958.2 | 3949.5 |
| 27.5°  | 3926.4 | 3894.6 | 3836.0 | 3822.4 | 3799.9 |
| 30°    | 3790.7 | 3754.2 | 3686.3 | 3672.9 | 3654.6 |
| 32.5°  | 3645.4 | 3618.6 | 3545.8 | 3518.5 | 3500.2 |
| 35°    | 3504.9 | 3459.8 | 3387.1 | 3359.7 | 3337.1 |
| 37.5°  | 3346.2 | 3305.4 | 3232.7 | 3201.0 | 3178.3 |
| 40°    | 3183.2 | 3146.6 | 3073.9 | 3033.5 | 3015.3 |
| 42.5°  | 3024.4 | 2987.9 | 2915.7 | 2870.0 | 2843.1 |
| 45°    | 2852.2 | 2820.5 | 2752.1 | 2702.6 | 2684.3 |
| 47.5°  | 2684.3 | 2652.5 | 2579.9 | 2529.9 | 2503.0 |
| 50°    | 2507.3 | 2484.7 | 2421.2 | 2357.6 | 2335.0 |
| 52.5°  | 2335.0 | 2303.3 | 2244.6 | 2194.5 | 2162.8 |
| 55°    | 2158.5 | 2131.1 | 2076.7 | 2022.4 | 1999.7 |
| 57.5°  | 1981.5 | 1958.8 | 1899.7 | 1845.3 | 1827.0 |
| 60°    | 1804.4 | 1786.7 | 1723.1 | 1673.1 | 1659.6 |
| 62.5°  | 1632.2 | 1600.4 | 1555.3 | 1510.1 | 1491.8 |
| 65°    | 1455.7 | 1428.3 | 1383.0 | 1342.1 | 1319.6 |
| 67.5°  | 1274.3 | 1251.2 | 1210.8 | 1179.1 | 1160.8 |
| 70°    | 1106.4 | 1088.1 | 1047.2 | 1015.5 | 997.7  |
| 72.5°  | 934.2  | 915.9  | 893.3  | 861.6  | 848.1  |
| 75°    | 761.5  | 752.9  | 729.7  | 702.9  | 712.0  |
| 77.5°  | 607.5  | 589.3  | 580.2  | 566.6  | 553.2  |
| 80°    | 453.6  | 448.8  | 439.7  | 426.3  | 417.1  |
| 82.5°  | 308.3  | 308.3  | 304.1  | 285.8  | 285.8  |
| 85°    | 185.7  | 181.4  | 177.0  | 163.1  | 158.8  |
| 87.5°  | 81.8   | 72.6   | 63.5   | 50.0   | 45.2   |
| 90°    | 2.3    | 27.8   | 75.5   | 70.9   | 73.2   |
| 92.5°  | 47.8   | 64.7   | 67.1   | 69.3   | 69.3   |
| 95°    | 112.5  | 134.0  | 137.8  | 137.8  | 134.0  |
| 97.5°  | 187.2  | 207.2  | 215.7  | 215.7  | 215.7  |
| 100°   | 273.5  | 291.1  | 297.3  | 297.3  | 295.0  |
| 102.5° | 364.4  | 377.5  | 385.9  | 388.2  | 385.9  |
| 105°   | 463.7  | 469.9  | 474.5  | 478.4  | 478.4  |
| 107.5° | 562.3  | 571.6  | 571.6  | 573.1  | 562.3  |
| 110°   | 657.8  | 670.1  | 670.1  | 670.1  | 664.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 761.0  | 774.2  | 771.8  | 765.7  | 761.0  |
| 115°   | 862.7  | 875.0  | 871.2  | 868.9  | 862.7  |
| 117.5° | 963.6  | 980.6  | 969.8  | 963.6  | 957.5  |
| 120°   | 1065.3 | 1082.3 | 1065.3 | 1065.3 | 1058.3 |
| 122.5° | 1157.7 | 1179.3 | 1168.5 | 1162.4 | 1157.7 |
| 125°   | 1254.8 | 1274.0 | 1267.9 | 1260.9 | 1258.7 |
| 127.5° | 1349.6 | 1373.4 | 1364.9 | 1355.7 | 1349.6 |
| 130°   | 1438.1 | 1465.8 | 1462.0 | 1457.4 | 1449.0 |
| 132.5° | 1537.5 | 1559.0 | 1560.6 | 1549.8 | 1543.7 |
| 135°   | 1623.0 | 1646.9 | 1651.5 | 1649.2 | 1643.1 |
| 137.5° | 1718.5 | 1737.8 | 1741.6 | 1740.1 | 1730.8 |
| 140°   | 1802.5 | 1821.7 | 1832.5 | 1832.5 | 1824.0 |
| 142.5° | 1888.8 | 1908.0 | 1914.2 | 1916.5 | 1908.0 |
| 145°   | 1970.4 | 1985.8 | 1998.1 | 2000.4 | 1992.0 |
| 147.5° | 2043.6 | 2062.9 | 2072.0 | 2076.0 | 2067.5 |
| 150°   | 2119.1 | 2132.1 | 2140.6 | 2147.6 | 2140.6 |
| 152.5° | 2186.1 | 2199.2 | 2210.0 | 2218.5 | 2210.0 |
| 155°   | 2253.1 | 2259.3 | 2266.2 | 2276.9 | 2270.1 |
| 157.5° | 2310.9 | 2315.5 | 2319.4 | 2334.7 | 2324.0 |
| 160°   | 2362.5 | 2367.1 | 2369.4 | 2382.5 | 2373.3 |
| 162.5° | 2410.2 | 2410.2 | 2412.6 | 2427.2 | 2416.4 |
| 165°   | 2451.0 | 2448.7 | 2448.7 | 2464.2 | 2453.4 |
| 167.5° | 2488.0 | 2481.1 | 2481.1 | 2496.5 | 2485.7 |
| 170°   | 2515.8 | 2509.6 | 2507.3 | 2522.7 | 2509.6 |
| 172.5° | 2535.1 | 2528.9 | 2526.6 | 2541.9 | 2528.9 |
| 175°   | 2550.4 | 2544.3 | 2539.6 | 2555.1 | 2541.9 |
| 177.5° | 2558.9 | 2552.7 | 2548.1 | 2561.2 | 2548.1 |
| 180°   | 2555.1 | 2555.1 | 2555.1 | 2555.1 | 2555.1 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 12.95            | 13.94 | 13.79 | 14.80 | 15.88 | 12.52          | 13.51 | 13.36 | 14.37 | 15.45 |
|                 | 3H   | 14.62            | 15.51 | 15.47 | 16.38 | 17.48 | 14.15          | 15.03 | 15.00 | 15.91 | 17.01 |
|                 | 4H   | 15.21            | 16.05 | 16.08 | 16.93 | 18.04 | 14.74          | 15.58 | 15.61 | 16.46 | 17.57 |
|                 | 6H   | 15.62            | 16.39 | 16.50 | 17.28 | 18.41 | 15.14          | 15.92 | 16.02 | 16.80 | 17.93 |
|                 | 8H   | 15.73            | 16.46 | 16.62 | 17.37 | 18.49 | 15.25          | 15.99 | 16.14 | 16.89 | 18.02 |
|                 | 12H  | 15.78            | 16.48 | 16.67 | 17.38 | 18.53 | 15.30          | 16.00 | 16.19 | 16.90 | 18.05 |
| 4H              | 2H   | 13.43            | 14.27 | 14.30 | 15.14 | 16.26 | 13.08          | 13.92 | 13.96 | 14.80 | 15.91 |
|                 | 3H   | 15.30            | 16.00 | 16.19 | 16.91 | 18.04 | 14.91          | 15.61 | 15.80 | 16.52 | 17.65 |
|                 | 4H   | 16.02            | 16.66 | 16.92 | 17.57 | 18.72 | 15.62          | 16.26 | 16.51 | 17.16 | 18.32 |
|                 | 6H   | 16.55            | 17.10 | 17.46 | 18.03 | 19.19 | 16.14          | 16.69 | 17.05 | 17.62 | 18.78 |
|                 | 8H   | 16.70            | 17.21 | 17.61 | 18.14 | 19.31 | 16.29          | 16.80 | 17.20 | 17.73 | 18.90 |
|                 | 12H  | 16.78            | 17.24 | 17.71 | 18.18 | 19.36 | 16.36          | 16.82 | 17.29 | 17.76 | 18.94 |
| 8H              | 4H   | 16.23            | 16.75 | 17.14 | 17.67 | 18.84 | 15.87          | 16.39 | 16.78 | 17.31 | 18.48 |
|                 | 6H   | 16.87            | 17.29 | 17.81 | 18.26 | 19.43 | 16.50          | 16.93 | 17.44 | 17.90 | 19.07 |
|                 | 8H   | 17.09            | 17.47 | 18.04 | 18.42 | 19.61 | 16.72          | 17.10 | 17.67 | 18.06 | 19.24 |
|                 | 12H  | 17.23            | 17.56 | 18.18 | 18.51 | 19.75 | 16.84          | 17.17 | 17.80 | 18.13 | 19.36 |
| 12H             | 4H   | 16.22            | 16.69 | 17.16 | 17.63 | 18.81 | 15.87          | 16.33 | 16.80 | 17.28 | 18.46 |
|                 | 6H   | 16.90            | 17.28 | 17.85 | 18.23 | 19.42 | 16.55          | 16.92 | 17.50 | 17.88 | 19.07 |
|                 | 8H   | 17.15            | 17.48 | 18.10 | 18.43 | 19.67 | 16.79          | 17.12 | 17.74 | 18.07 | 19.31 |

END OF REPORT